Unit conversion practice pdf

Jan Hakan Dahlstrom/Getty Images Unit conversions are one of the first topics you should master in a chemistry course. This is a collection of 10 chemistry test questions with answers about unit conversions. Convert the following measurements to m.a. 280 cmb. 56100 mmc. 3.7 km Convert the following measurements into mL.a. 0.75 liters. 3.2 x 104 µLc. 0.5 m3 What is bigger: 45 kg or 4500 g? Which one is bigger: 45 miles or 63 km? How many cubic meters are there in a space of 5m x 10m x 2m? What is the volume of a 12 oz. can of soda in mL? What is the mass of a 120 pound person in grams? What is the height in meters of a 5'3 person? Six gallons of gasoline costs $21.00. How does a litre cost? A man makes a 27.0 km journey in 16 minutes. A. How far was the journey in miles?b. If the speed limit was 55 miles per hour, was the driver speeding? 1. (a) 2,8 m b. 56,1 m c. 3700 m2. a. 750 mL b. 32 mL c. 5 x 105 mL3. 45 kg4. 45 miles (72.4 km)5. 3531.47 ft36. 354.9 mL7. 54431 grams8. 1.60 m9. Nine-20 cents. a. 16.8 miles b. Yes (63 mph) Go to Main ContentSkip to Navigation Math You Need > Unit Conversions > Unit Conversions Practice Problems Jump down to:Density | Scale If you don't have a list of common conversion factors in your book, download and print this sheet of general geoscience conversion factors (Acrobat (PDF) 40kB 3 09 Sep). open the link below to use while you make your calculations. If you need a reminder of the steps, download and print this worksheet (Acrobat (PDF) 44kB Apr11 08) and guide you through the unit conversion steps. Finally you download a sheet with all the problems (Acrobat (PDF) 48kB Jul25 09) so you can print it out and work yourself. Problem 1: Imagine driving your car in Canada. As you drive, you notice that the speed signs have numbers like 120 (on the highway) and 50 (in the city). As you start to accelerate, you realize that the signs are in km/h. Unfortunately, your speedometer only reads in mi/hour. Find out how fast you can go if the sign says: 120 km/h Hide Let's do this using the steps you learned in the previous page. Write the units you have (if necessary as a fraction): Hide Write from the units you want to end up with: Hide Determine the correct conversion factors (in some cases there will be more than one conversion factor for each of the units you have): Hide since hours remain the same at the bottom, you only need a conversion factor: km to mi. So, you write 1km = 0.6214 mi Evaluate appropriate arrangement for fractures (i.e., which units belong in counter (above) of the fraction? Which units should be in denominator (below)? Remember, units cancel when one unit is in the counter and the other is in the denominator). Remember that when you multiply fractions (as you do in step 6 below), you only cancel units when they are both in the counter and in denominator. Hide Since km is in in counter in the original units, km should be in the denominator so that we can cancel: Set up the conversion by writing the breaks in a row with multiplication boards between: Hide Evaluate. Do the original units cancel so you're left with only the requested units? If not, repeat steps 3 and 4 until you are left with the right units: Hide We cancel km and end with mi /hr (that's what we want!) Multiply over top and bottom: Hide If necessary, reduce the fraction. Hide your answer evaluate. Hiding Is a speed limit of about 75 mph (mi/hour) a reasonable speed limit? If you have 0.75 or 75,000, would you acknowledge that it's not reasonable? 75 km/h Hide Write the units you have (if necessary as a fraction): Hide Write the units you want to end up with: Hide Determine the correct conversion factors (in some cases there will be more than one conversion factor for each of the units you have): Hide since hours remain the same at the bottom, you only need a conversion factor: km to mi. So, you write 1km = 0.6214 mi Evaluate appropriate arrangement for fractures (i.e., which units belong in counter (above) of the fraction? Which units should be in denominator (below)? Remember, units cancel when one unit is in the counter and the other is in the denominator). Remember that when you multiply fractions (as you did in step 6 below), you only cancel units when they appear in both the counter and the denominator. Hide Since km in the counter is in the original units, the km must be in the denominator so that we can cancel: Set the conversion by writing the fractions in a row with multiplication boards in between: Hide Evaluate. Do the original units cancel so you're left with only the requested units? If not, repeat steps 3 and 4 until you are left with the right units: Hide We cancel km and end with mi /hr (that's what we want!) Multiply over top and bottom: Hide If necessary, reduce the fraction. Hide your answer evaluate. Hiding Is a speed limit of about 46 mph (mi/hour) a reasonable speed limit? If you have 120 or 0.075, would you acknowledge that it's not reasonable? You spend about 45 miles per hour 50 km/h hiding Drive Write from the units you have (if necessary as a fraction): Hide from the units you want to end up with: Hide determine the correct conversion factors (in some cases there will be more than one conversion factor for each of the units you have): Hide since hours remain the same at the bottom, you only need one conversion factor: km to mi. So, you write 1km = 0.6214 mi Evaluate appropriate arrangement for fractures (i.e., which units belong in counter (above) of the fraction? Which units should be in denominator (below)? Remember when one unit is in the counter and the other is in the denominator). Remember that when you multiply fractions (as you did in step 6 below), you only cancel units when they appear in both the counter and the denominator. Hiding Since km km in the counter in the original units, the km must be in the denominator so that we can cancel: Set the conversion by writing the fractions in a row with multiplication boards in between: Evaluate Hiding. Do the original units cancel so you're left with only the requested units? If not, repeat steps 3 and 4 until you are left with the right units: Hide We cancel km and end with mi /hr (that's what we want!) Multiply over top and bottom: Hide If necessary, reduce the fraction. Hide your answer evaluate. Is a speed limit of about 30 mph (mi/hour) a reasonable speed limit? If you were 0.80 mph or 30,000 mph, would you recognize that it's not reasonable? You drive about 30mph! Density Conversions (multiple step problems) Problem 2: Geologists' observations suggest that the two most common rocks exposed to the Earth's surface are granite (continental crust) and basalt (oceanic crust). From travel times of earthquake waves we also know that the average density of the earth is about 5.5 g/cm3. See if you're doing some unit conversions using information in the questions below to determine if the whole earth can be made of these two rock species alone. As an astute observer walking around on continental crust (granite), you decide to test the hypothesis that the Earth is made entirely of granite. You weigh a 1.00 cubic foot piece of granite on your home scale and find that it weighs 171 pounds. For example, you determine that the granite has a density of 171 lb/ft3. Convert the density of your granite into g/cm3. Given the above information, could the earth be made entirely of granite? Hide We're going to go through this with the steps of the Unit Conversions page. Copy the number and units as a fraction: Hide Because the block of granite is 1 cubic feet, you 1 at the bottom of the fraction. Write down the units you want to end up with: Hide Find the conversion factors for what you have (pounds and feet (or cubic feet)) to get what you want (grams and cm (or cubic cm)). Hide pound to gram: 1 lb = 453.3924 g feet to cm: 1 foot = 30.48 cm feet to cubic feet: 1 ft * 1 ft * 1 ft = 1 ft3 cubic meters to cubic meter cubic meter to cubic meter centimeters: 1 ft3 = 30.48 cm * 30.48 cm * 30.48 cm = 28,316 cm3 Note what you have and what you want to end up with. Then write down conversion factors from step 2 as fractions, so that units cancel. Hide You want to be able to cancel lb (so that the unit must be at the bottom of the converting fraction) and ft3 (so that the unit must be at the top of the converting fraction): Once you've written all the conversion fractions so that the original value is multiplied by them (see last step), evaluate. Do the original units cancel so you end up with what the question asks? Hide The fractures multiply the top and bottom): Divide the resulting number to get an answer. Hiding Is this a reasonable answer? Hide This is not the answer we were looking for - 5.5g/cm3. But it's within an order of magnitude. The It also a number greater than the density of water (that's 1 g/cm3) and we know that granite is denser than water! So it's a reasonable number. However, it shows that the earth cannot be made entirely of granite! Given that basalt seems to stand up well when the ocean crust pulls apart on Mid-Ocean ridges, you might decide that maybe the whole Earth is made of basalt. On your scale, a 64 in 3 (4in x 4in x 4in) block of basalt weighs 116 grams. Use this information to calculate whether the earth's average density (5.5 g/cm3) can be explained by an earth made entirely of basalt. Hide We're going to go through this with the steps of the Unit Conversions page. Copy the number and units as a fraction: Hide Write the units you want to end up with: Hide Find the conversion factors for what you have (pounds and feet (or cubic feet)) to get what you want (grams and cm (or cubic cm)). Hide oz to gram: 1 oz = 28.349523 g in up to cm: 1 inch = 2.54 cm to cubic centimeters: 1 in * 1 in * 1 in = 1 in3 cubic in to cubic centimeters: 1 in3 = 2.54 cm * 2.54 cm * 2.54 cm = 16.4 cm3 Note what you have and what you want to end up with. Then write down conversion factors from step 2 as fractions, so that units cancel. Hide You want to be able to cancel oz (so that this unit must be at the bottom of the converting fraction) and in3 (so that the unit must be at the top of the converting fraction): Once you have written all the conversion fractions so that the original value is multiplied by them (see last step), evaluate. Do the original units cancel so you end up with what the question asks? Hide The fractions multiply (over the top and bottom): Divide the resulting number to get an answer. Hiding Is this a reasonable answer? Hide This is not the answer we were looking for - 5.5g/cm3. But it's within an order of magnitude. It is also a number greater than the density of water (that is 1 g/cm3) and we know that basalt is denser than water (it sinks)! So it's a reasonable number. However, it shows that the Earth cannot be made entirely of basalt either! So, there must be something closer down there - like the iron/nickel core! Problem 3: You work with a card with a fraction scale of 1:24,000 (which means that 1 unit on the map equals 24,000 units on the ground - 1mm = 24,000 mm or 1 inch = 24,000 inches). See if you can determine solutions to the following problems that geologists face when working with maps. You walk to a field area and measure the length of the path as 18.5 inches. Calculate how many miles you have to walk to get to the interesting rocks/geology? Hide This is actually a two-step conversion problem. First, you need to convert your map measurements into measurements on the ground. Then convert to units you understand. First, think about what you have (18.5 in on the map and a scale) and what you want to know (how many miles 18.5 inches represents on the ground). It may help to about inches on the map and inches on the ground as well as different units. For starters, write the fractional scale as a fraction (with the distance on the ground at the top (because that's what we eventually want to end up with)). You just calculated how many inches to cover on the course. But, that just seems like a lot, so let's turn those inches into miles! First, let's write out the correct conversion factors: 1 foot = 12 inches and 1 mile = 5,280 feet. Next, we need to write these conversion factors as fractions. Don't forget to arrange them so that units you don't want to cancel and you end up with units you do want! Then we can cancel units. Do we end up with miles? Yes! Now we multiply over the top and bottom (note that the bottom number has no units because both are cancelled by others): And if we erase fractures: We find that our walk will be 7 miles! Once you get to your area of the area of the area, you are going to create a geological map of that area. You have a mechanical pencil that has a lead that's 0.3 mm thick. The smallest feature you map is something that is 0.3 mm wide on the map. How wide (in m) can that function be? Hiding this, like 3.1 is actually a two step conversion problem. First, you need to convert your map measurements into measurements on the ground. Then you convert to units that you understand. First think about what you know (0.3mm on the map and a scale) and what you want to know (how many meters represents 0.3mm on the ground). It can help to think about mm on the map and mm on the ground as different units. For starters, write the fractional scale as a fraction (with the distance on the ground at the top (because that's what we eventually want to end up with)). You just calculated how many millimeters thick a function can be. But because this is the metric system, we can modify it so that you don't have to keep many zeros in your head. First, let's write out the correct conversion factors: Then we need to write these conversion factors as fractions. Don't forget to arrange them so that units you don't want to cancel and you end up with units you do want! Finally, cancel the appropriate units (mm in this case) and multiply over the top and bottom. You hide each function wider than 7.2m. The cool thing about the metric system is that it is based on the number 10. This means that conversions within the metric system include moving zeros. It also means that when doing calculations, many times you cancel zeros. How does this work? Zeros can only be cancelled if they occur on the top and bottom of a fraction. In the above problem you cancel two zeros on either side of the fraction: Please note that the calculation then becomes 72 divided by 10. The of us can easily divide by 10, making this calculation much easier. In fact, if you're at that point, you don't even need a calculator. Keep this in mind as you do calculations! Now you have an idea of the size of features that be drawn on your map. Turn your answer into problem 3.2 to feet. Hide This is a simple conversion with just one step. The conversion factor in the table (see link above) is 1 m = 3,281 feet. First, let's set our equation with fractures: then cancel units and multiply top and bottom sheets You map a function that is about 24 meters wide. Next steps Okay, I'm ready to try the review. Take me there!. If you're there, don't forget to log in with your username and password. Do you need more practice? There are numerous websites that have practical problems for unit conversions. Some of them are listed below. Use these links for more exercise with unit conversions! « Previous page next page » » »